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# Research Note

## NORTHERN ROCKY MOUNTAIN FOREST AND RANGE EXPERIMENT STATION

U. S. DEPARTMENT OF AGRICULTURE

Missoula, Montana

No. 51

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### × TEST OF HEMLOCK RAILROAD TIES COMPLETED

By  
Forest Utilization Service 1/

U.S.D.A., NAL

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CATALOGING PREP

The 1946 inspection of the hemlock test track, located on the Northern Pacific Railway main line track near Missoula, Montana, brought to a close a study that was started early in 1910.

The test was originally designed to determine the desirability of Inland Empire western hemlock as a tie species, and the fact that some other species crept into the picture only added to the many benefits the study has provided.

A total of 1,800 ties, consisting of both sawed and hewn varieties, was included in the test. Of this total, 1,072 were western hemlock, 436 western larch, 166 Inland Empire Douglas-fir, 102 true fir, 18 Engelmann spruce, and 6 of three other species which are not included in the final summary because of the inadequacy of the sample.

The ties were purchased in 1909 and shipped to the Northern Pacific treating plant at Paradise, Montana, where they were treated by the Lowry pressure process. An 80-20 solution of coal-tar creosote and refined coal-tar oil was used as a preservative, and an average retention of 6.75 pounds per cubic foot was obtained. The ties were not incised or bored.

The treated ties were installed in March of 1910 in a main line track close to Missoula. The ballast consisted of pit-run gravel. The original installation did not include plates, and it was not until 1912 that the ties were equipped with 7x9-inch Northern Pacific plates. In 1926 the track was relaid with 100-pound rail and 7-3/4x10-3/4-inch standard Northern Pacific plates.

The first inspection was made in 1917 by Mr. Andrew Gibson, then superintendent of the Northern Pacific tie-treating plant. The second inspection was made in 1924, after which a regular inspection was made every two years. Members of the Forest Service accompanied the inspection party starting in 1926.

The following summary shows the condition of the track as of August 1946, or after 36 years of relatively hard service. The test was closed at that time

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because all true fir and Engelmann spruce ties had been replaced on account of being no longer serviceable. The remaining hemlock, larch, and Douglas-fir ties were practically all replaced due to renewal of track ballast. It was estimated they would have had an additional life of 6 years; hence 6 years was added to the computed average life of these three species.

Condition of Railway Ties in the  
Northern Pacific Test Track at Missoula, Montana,  
at Final Inspection, August 1946

Species	:	:	Renewals		:
	:	:			:
	:	Number	:	:	Average
	:	in	Total number,	Percent	life,
	:	test	all causes, as	of	years
	:	:	of August 1946	total	:
Western hemlock		1,072	1,045	97	30.6
Western larch		436	423	97	33.4
Douglas-fir		166	147	89	35.4
True fir		102	102	100	29.7
Engelmann spruce		18	18	100	25.3

